



# Hallow on Significance of Maternity Insurance Actuarial and Characteristics of the System in our Country

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## Abstract

The maternity insurance refers to the insurance system that the female staff obtains the economic help from the society due to temporary incapacity or suspension of the normal source of income caused by pregnancy and childbirth. It is a policy and welfare-oriented social insurance item. With the development of social economy and improvement of people's living standards, the maternity insurance benefits have improved successively as well. Therefore, the maintenance of the maternity insurance funds balance shall be based on the maternity insurance funds actuarial and prediction, thus the maternity insurance funds might be effectively operated.

**Key words:** Social insurance; Maternity insurance; Maternity insurance system; Maternity insurance actuarial

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## INTRODUCTION

### 1. ESTABLISHMENT OF THE MATERNITY INSURANCE SYSTEM IN OUR COUNTRY

The maternity insurance system in our country was established in early 1950s. In February 1951, the State

Council promulgated *Labor Insurance Regulation of the People's Republic of China* and made the maternity insurance as a measure to regulate. In January 1953, the Ministry of Labour formulated *Amended Draft of Implementation Rules for Labor Insurance Regulation of PRC*, which specified the relevant contents of the maternity insurance in details. The *Notice on Reproduction Leave of Female Employees* promulgated by the State Council in 1995 made supplementary explanations on the maternity insurance of female workers in administrative organizations and public institutions.

The establishment of maternity insurance system in new China greatly reduced the mortality rate of infant and puerperal and pregnant women. Infant mortality rate (IMR) refers to the ration of death toll of infant lee than one year old somewhere in some year and number of live births in the same year. Data has showed that the IMR was as high as 200% before 1949 when the New China was founded. In 1975, this indicator descended to 47%. Following that, it declined to 34.7% in 1981 and 21.5% in 2005. The decrease of IMR not only reflected the improvement of infant health condition but also indicated the antenatal and puerperal health states of pregnant women. Maternal mortality rate refers to the maternal death toll for one thousand live births somewhere in some year. The maternal death means the deaths of women in gestation period, delivery period or within 42 days after delivery. According to relevant data, the maternal mortality rate was 15‰ before the foundation of New China. After the foundation of New China, the Party and Chinese governments paid great importance to the maternal and child care work, popularized the relevant knowledge actively and adopted new delivery method, which made the maternal mortality rate declined to 0.619‰. In 2004, the maternal mortality rate decreased to 0.483‰, The drop of maternal mortality rate reflected the improvement of health conditions of women.

## 2. REFORM OF MATERNITY INSURANCE SYSTEM IN CHINA

In 1986, the Ministry of Health, Ministry of Labour and Personnel, All China Federation of Trade Union and the All-China Women's Federation issued *Temporary Provisions on Health Care of Female Workers (Trial)*, which marked the start of the reform on maternity insurance system. On July 26th, 1978, the People's Government of Nantong City, Jiangsu Province promulgated Overall-planning Temporary Provision of Maternity Insurance Funds for All People and Female Workers of Collective Enterprises in Nantong and took the lead in launching the maternity insurance social pooling reform. After that, many local governments promulgated the local regulations one after another and made a trial on the socialized reform of maternity insurance. On April 20th, 1993, the *Provisions on Surplus Staff Resettlement of State-owned Enterprises* as issued by the State Council stipulated that female workers in pregnant or suckling period can be approved to have a leave for 2 years after raising an application. During the leave, the living expenses calculated according to 60% of the original salary will be provided by the enterprises. If the leave includes the maternity leave, the salary will be paid during the maternity leave according to relevant national regulations. As of 1994, more than 300 counties and cities in 18 provinces nationwide had made the trial on the socialized reform of the maternity insurance system reform.

On December 14th 1994, the Ministry of Labor published *Trial Procedures for Maternity Insurance of Enterprises Employees (Trial Procedures)* and provided the policy basis for the social overall-planning reform of national maternity insurance. The trial procedures specified that the employer would be exempted from the responsibility of maternity insurance for female workers. Instead, they shall pay the maternity insurance premium according to the standard of less than 1% of the total salary to the social insurance agency organization. The social insurance agency organization would conduct unified management on maternity insurance funds. The maternity allowance and expenses arisen from the childbirth of female workers will be transferred to the account of unit that female workers serve from the maternity insurance funds by the maternity insurance funds agency organization according to actual needs, so female workers can get their maternity insurance from their employers. The *Program for Development of Chinese Women (2001-2010)* issued by State Council in 2001 pointed out that the maternity insurance system shall be established universally. Thus the maternity insurance system was established nationwide.

In 2005, the Ministry of Labor and Social Security designated 12 cities as the key contacting cities for coordinated promotion of both maternity insurance and

medical insurance with an aim to gain experiences on key points and then popularize it. So far, majority of regions has included the maternity insurance into the coverage of basic medical insurance for management, which achieved significant results.

## 3. ACHIEVEMENTS OF CHINESE MATERNITY INSURANCE SYSTEM REFORM

The achievements of Chinese maternity insurance system reform mainly include the following aspects.

Firstly, alleviate the burden of the employing units. The socialization reform paid for maternity insurance separates the maternity insurance fees of female employees from the employing units, paid wholly under maternity insurance fund. It alleviates the economic burden of the employing units, especially the employing units with most female employees, beneficial to the employing units to participate in the market competition equally.

Secondly, maintain the legitimate right of fertile women. Fertility is the individual action as well as a social behavior. Under the enterprise insurance system, employing units shall shoulder the responsibilities and the related expenses, which discourages employing units to employ female employees. While laying off the redundant labor force, the female employees are laid off mainly. The social pooling of maternity insurance guarantees fertile women to enjoy the equal right and opportunities of for employment as men.

Thirdly, promote the implementation of sound child birth and bearing. After adopting socialization management of maternity, employing units can only pay the maternity insurance charge not more than 1% of the total salary amount to the social insurance handling agencies. Social insurance handling agencies adopt unified management on the maternity insurance fund. The economic compensation, medical care fitting and children's health fees during the fertility period shall be covered by the maternity insurance fund. This means can effectively avoid the abrupt lowering of the family living standard due to the maternity, relieve the worries of maternity women and promote the implementation of sound children birth and bearing policies.

## 4. ISSUES EXISTING IN CHINESE MATERNITY INSURANCE SYSTEM REFORM

Since the implementation of Program for Implementation of Enterprise Staff Birth Insurance in 1995, it was popularly welcomed by the employing units and female employee, but there are still many issues exiting.

Firstly, the implementing scope remains narrow and the degree of socialization is low. Presently, the guarantee

scope of Chinese maternity insurance keeps narrow, only covering the married female labors, neglecting all the maternity women like welfare countries, nor including the male employees. The issue of family planning not only relates to female employees, but also male employees. It is very necessary to cover the spouses of maternity women into the scope of maternity insurance. For example, the side effect against female employees caused by sterilization operation becomes increasingly severe, while sterilization operation on male employees is very easy and only with slight side effect. It is beneficial to popularize the family planning policies to incorporate male employees into the scope of maternity insurance.

Secondly, the degree of the social pooling remains low. The degree of Chinese maternity insurance social pooling still remains low. With the promotion of maternity insurance of system reform, it is necessary to transform from county (district) level to provincial and city (Prefecture-level city) level for pooling, so as to improve the level of social pooling and improve the utilization rate of maternity insurance fund.

Finally, the protection of women rights and interests is subject to the legal provisions. *Provisions for Trial Implementation* is only the temporary child-bearing insurance policies and specification. It is expected to be confirmed in the form of regulations, to regulate the actions of employing units and behaviors of employees, and guarantee the effective implementation of bearing insurance laws and regulations.

## 5. DATE REQUIREMENT ON MATERNITY INSURANCE ACTUARIAL SCIENCE

The data requiring consideration for maternity insurance include the regulations on coverage scope, legal conditions, awaiting period, methods of determining insurance premium and payment period, as well as necessarily considering the coordination with unemployment insurance and basic medical insurance. Besides, clauses involved in different beneficiaries of different kinds shall be considered as well. For example, insurance premium should be paid to the new-born child's father or the mother, difference may exist in the period paying to mother and father; insurance premium may be distributed according to father's or mother's wishes.

As for the statistical data, apart from considering the tendency of some annual income and payment, actuaries shall obtain the following data.

- Proportion of female employees
- Maternity rate of female employees insured in history
- Maternity insurance benefit for payment in different ages
- Historical average payment period in different ages
- Average salaries of female employees to male employees

Apart from the above data, the data of the national population structure can give more detailed information as for the estimated cost tendency on the future. The overall

fertility rate has its guiding significance to some extent. It may be higher, equal or lower than the fertility rate of insured female employees.

## 6. ESTIMATION ON COST AND LIABILITIES OF MATERNITY INSURANCE FUND

### 6.1 Cost Estimation of Fertility Insurance Fund

Maternity insurance fund refers to the necessary materials or economic foundation promised to realized the fertility insurance, mainly determined by maternity insurance fund. Presently, the income of maternity insurance mainly comes from the income of maternity premium. Partial income comes from the investment revenue of the surplus of maternity insurance fund. The income of maternity insurance fund shall be under unified management by setting up pooling account by the social insurance institute. Maternity insurance premium is determined by the number of employees, coverage rate of maternity insurance, employees' average salary and regulated payment rate. The relational formula may be expressed as follows:

Annual income of maternity insurance premium =  
 Number of employees × Coverage rate of maternity insurance × Employees' average salary × Payment rate

Investment income of annual maternity insurance surplus =  
 Average surplus of annual maternity insurance fund × Average rate of return

It can be expressed with mathematical formula as follows:

$$AFR = N \cdot I \cdot \bar{W} \cdot r$$

$$AIR = AS \cdot (\sqrt{1+i} - 1)$$

Where,

AFR—Annual income of maternity insurance premium

AIR—Investment income of annual maternity insurance fund investment

AS—Annual surplus of maternity insurance fund

N—Number of employees

I—Coverage rate of maternity insurance system

$\bar{W}$ —Average employees' salary

i—Annual income rate

r—Annual payment rate of maternity insurance

### 6.2 Estimation of Maternity Insurance Fund Liabilities

Maternity insurance fund liabilities refer to the total value payable to implementing the maternity insurance treatment commitment. The liabilities payments of maternity insurance fund mainly include two parts of medical expense payment and maternity allowance and payment of management fees. The payment of the two items mainly depend on the number of female employees, age structure of female employees, age maternity rate, medical fee of average maternity care. The specific relationship formula can be expressed as follows:

Annual medical fee = Number of female employees × Fertility rate of female employees × Average medical

charge = Average medical fee  $\times \sum$ (Number of female employees  $\times$  Fertility rate in different ages of female employees  $\times$  Age structure of female employees)

Annual maternity allowance payment = Number of employees  $\times$  Ratio of female employees  $\times$  Average payment months of maternity allowance  $\times$  Social average salary  $\times$  Ratio of maternity allowance in social monthly average salary

Annual payment of maternity insurance = Annual medical care fee payment + Annual maternity allowance payment + Annual management expense payment

The above-mentioned last equation may be expressed as follows:

$$AFE = AHE + ABE + AME$$

Where,

*AFE*—Annual maternity insurance fund payment

*AHE*—Annual medical fee payment

*ABE*—Annual maternity insurance allowance payment

*AME*—Annual management fee payment

From the above formula can be seen that, the ratio of maternity employees and ratio of female employees of child-bearing age peak are the important factors determining the payment of birth insurance premium.

Within the long term, the long-term balancing payment contribution rate can be estimated according to the balancing formula of the maternity insurance fund payment value equals birth insurance fund. Provided that the forecast period is *N* year, then the following formula exists.

$$\sum_{t=1}^N \frac{AFR_t}{(1+i)^t} = \sum_{t=1}^N \frac{AFE_t}{(1+i)^t}$$

According to the above-mentioned formula, combined annuity calculating formula, the average contribution rate  $\bar{r}$  within the estimation period can be estimated.

## 7. AFFECTING FACTORS OF MATERNITY INSURANCE PREMIUM

### 7.1 Fertility Rate of Female Employees

The fertility rate difference exists between female employees and common unemployed women. The fertility rate of female employees is lower. However, while making the fertility rate statistics, only the overall fertility rate of women can be obtained generally. Thus, while making actuarial operation, special targeted analysis and investigation shall be made. The payment of fertility rate in different ages matches with the insured women in different ages. It is necessary to pay attention to the ratio of married women in different ages. As for the present fertility insurance plan, it is feasible to use the former planned experience to estimate and check the rationality of the present plan.

### 7.2 Payment Period of Insurance Premium

The level of fertility insurance premium is in proportion

to salary. The low insurance level may possibly make women return their working post before enjoying their maternity leave completely. In some countries, this phenomenon cannot win some allowance for the maternity leave, which may affect the actual payment period of insurance premium.

Otherwise, whether the country would retain the posts for the women employees in maternity leave and how long will be kept would affect the payment period of insurance premium.

### 7.3 Payment Objects of Insurance Benefit

The maternity plan in some countries allows any party of the parents to obtain the maternity insurance benefit, though the initial parts have mothers as the payment receivers (the initial three to four months). This flexibility can increase the average payment period of benefit or cause the maternity insurance benefit to fathers with higher income. The payment level of insurance benefit would be a little higher. However, the experience in some countries (Sweden and Canada) shows that, the proportion obtained by fathers would be very low. Over 90% of the insurance benefits still are paid to the mothers.

## 8. ADOPTION

In some countries, adopting infants can win insurance benefits. The basic data can only require the data of the adopted aspects. Although this does not constitute the important part, the actuary operation shall consider all the related factors including this as far as possible.

## CONCLUSION

The maternity insurance actuarial aims to maintain a balance between receipts and payments of the maternity insurance funds so as to realize the efficient operation of such funds. In respect of levy, the maternity insurance funds mainly targets for the women at the right age of childbirth and their employers. In term of expenditure, the payment target for maternity insurance funds is generally the eligible female workers. Therefore, whether receipts or payments can be easily estimated. This will be beneficial to maintain the balance of receipts and payments of maternity insurance funds.

The management authority of the maternity insurance usually makes the local birth quotas quantity, salary standard and payment of hospitalization costs as the reference in calculating the levy and payment amount of maternity insurance.

In the long run, there are still some risks existing with maternity insurance funds levy and payment. Firstly, there are system risks. With the improvement of economic development level, the local economic environment will require more maternity insurance funds payment. Secondly, there are some individual risks. If the economic development state in one region is better than that in

other regions, the maternity insurance funds payments in such region shall adjust appropriately. So from these two aspects, actuarial shall be strengthened on the maternity insurance. From the perspective of the whole society, the significance of maternity insurance funds actuarial mainly lies in the following aspects:

Firstly, the maternity insurance is a social policy and welfare-oriented social insurance item. With the continuous improvement of living standards, the maternity insurance benefits improve as well. Therefore, the maintenance of balance of the maternity insurance funds shall be based on maternity insurance funds actuarial and prediction.

Secondly, one important aspect of maternity insurance funds balance is the insurance funds payment, including maternity health care expense and allowance payment. The former refers to the relevant medical expenses, caring expense and other expenses specified by the insurance accrued relating to the insured during the childbirth period. The latter refers to the loss of wage income caused by work suspension to the insured owing to childbirth. The maternity allowance will remain constant in short period, but might increase along with the rising of social average salary. The actuarial of maternity insurance funds payment refers to the actuarial of both health care expenses and maternity allowances.

Lastly, another important aspect of maternity insurance funds balance is the insurance funds receipts. According to the actuarial estimation of maternity insurance funds payment, the annual income level and long-term income scale of maternity insurance funds can be determined and then the annual premium payment proportion and long-

term premium payment portion can be decided. During the process of calculation of maternity insurance funds receipts and premium payment proportion, basic actuarial principle and technology are indispensable basis.

The maternity insurance funds are collected and paid by local social insurance agency organizations in a unified way. Long-term planning and prediction management shall also be conducted by the local social insurance agency organizations as well. The financial and audit department of the same level are responsible for the supervision of the maternity insurance management.

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